

## Fast Acting Flow Control Valve, Phase I

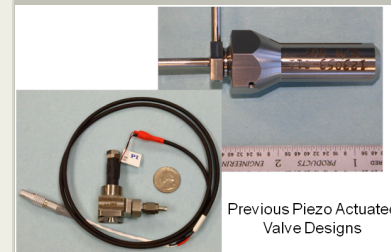
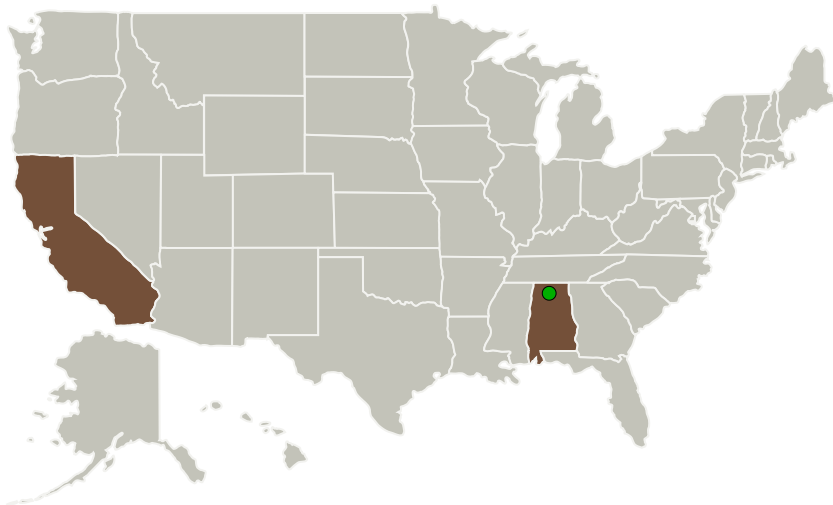
Completed Technology Project (2014 - 2014)



## Project Introduction

High power electric propulsion systems have the potential to revolutionize space propulsion due to their extremely high performance. This can result in significant propellant savings on space vehicles, allowing the overall mass to shrink for launch on a less expensive vehicle or to allow the space vehicle to carry more payload at the same weight. Many of the electrical propulsion systems operate in pulse mode, pulsing hundreds or even thousands of times per second. Creating reliable valves that can operate in pulse mode for extremely long life and at low power are critical in these applications. WASK Engineering will develop a normally closed, piezo electric operated valve for application to pulsing electrical thrusters. The benefits of such a valve includes 1) demonstrated ability to operate at frequencies from 0 Hz to 4,000 Hz, 2) ability to throttle continuously from 0-100% open, 3) extremely fast response, 4) low power usage, 5) infinitely variable valve operating waveforms, sine wave, square wave, saw tooth, custom wave form, etc., 6) no EMI generated, 7) very small size provides options when locating valve, 8) demonstrated ability to operate at pressures exceeding 1,000 psi, and 9) very low part count for reliability.

## Primary U.S. Work Locations and Key Partners



Fast Acting Flow Control Valve  
Project Image

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Organizations Performing Work	Role	Type	Location
WASK Engineering, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Cameron Park, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

## Primary U.S. Work Locations

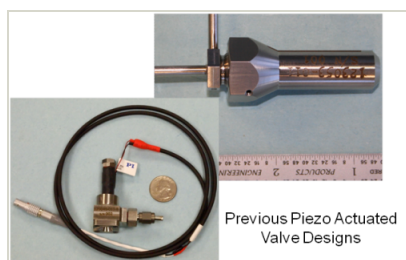
Alabama	California
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## Project Transitions

**June 2014:** Project Start**December 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140529>)

## Images

**Project Image**

Fast Acting Flow Control Valve

Project Image

(<https://techport.nasa.gov/image/130981>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

WASK Engineering, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

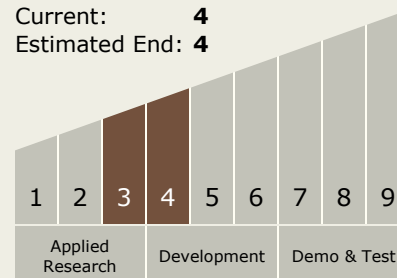
**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Wendel M Burkhardt

## Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

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### Technology Areas

#### Primary:

- TX01 Propulsion Systems
  - └ TX01.2 Electric Space Propulsion
    - └ TX01.2.1 Integrated Systems and Ancillary Technologies

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System